MINOR NOTICES

Gulf biologic station.—This station was established in 1903 by the state of Louisiana at the mouth of the Cameron River. The region is about at sea-level and practically treeless, the station itself being on a ridge running parallel to the sea and traversing a salt marsh. The plants of this very interesting locality have been published in a catalogue prepared by R. S. COCKS.[4] In addition to the list of species of the immediate vicinity, there are notes on certain species of the prairie region of southwestern Louisiana.—J. M. C.

Das Pflanzenreich.[5]—Part 29 contains the Erythroxylaceae by O. E. SCHULZ. After the usual preliminary account of literature, general characters, anatomy, geographical distribution, etc., the synopsis of the family is presented. Besides the monotypic genus Aneulophus, the family contains only the large genus Erythroxylum, which is credited with 193 species, 41 of which are described as new. The author breaks up the genus into 19 sections, to each of which a name is given.—J. M. C.

Key to trees and shrubs.—COULTER and DORNER[6] have published a convenient untechnical key to the genera of trees and shrubs of Indiana and the neighboring states, based chiefly upon leaf characters. A previous edition, now exhausted, was restricted to the forest trees, but the value of the present edition is much increased by including the shrubs.—J. M. C.

NOTES FOR STUDENTS

Mendelian inheritance.—DAVENPORT[7] in a lecture before the Washington Academy of Sciences discussed Mendelian inheritance in the light of his studies on poultry. After saying that "expectation has been so often realized that MENDEL'S law has gained deserved fame as the most important law of inheritance yet enunciated," he proceeds to give a few non-conformable cases, and concludes that there must be some more inclusive law. This he calls the "law of potency," the gist of which may be given in his own words thus: "Between the two extremes of equipotency and allelopotency lies the great mass of heritable characteristics which when opposed in heredity exhibit varying degrees of potency." It is not clear why this should be called a law; it seems rather to be a denial that any law exists. Some cases similar to those cited have been found to conform with

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[4] COCKS, R. S., The flora of the Gulf biologic station. Baton Rouge: La. State Board of Agric. and Immigration, Bulletin 7. pp. 42. 1907.

[5] ENGLER, A. Das Pflanzenreich. Heft 29. Erythroxylaceae von O. E. SCHULZ. pp. 176. *figs.* 32 (297). Leipzig: Wilhelm Engelmann. 1907. *M* 8.80.

[6] COULTER, STANLEY, and DORNER, HERMAN B., A key to the genera of the native forest trees and shrubs of Indiana. pp. 24. Lafayette: The Authors. 1907. 20 cents.

[7] DAVENPORT, C. B., Heredity and Mendel's law. Proc. Wash. Acad. Sci. 9:179–188. 1907.

Mendelian expectation upon keener analysis of the characteristics involved, and it seems early for the formulation of a law to accommodate exceptional cases until hypotheses are exhausted for making them conform to laws now so fully demonstrated as those of MENDEL. There is no necessity for the assumption that there is an all-inclusive law of heredity, and it seems probable that there may be a number of more or less independent laws of greater or less inclusiveness which separately or conjointly may explain each single instance of inheritance. Some evidence exists that "variable potency" may represent a fact, but so far as the evidence goes, this fact is of much smaller significance than the segregation of pure gametes. Indeed it is conceivable that variations in potency may be due to several or many different causes, and that it does not represent a sufficiently unified series of phenomena to warrant its designation as a law.

COOK[8] in discussing DAVENPORT'S lecture attempts to classify various methods of descent, and limits "Mendelism" to cases of complete dominance, quite ignoring the feature of Mendelism now everywhere recognized as the most important, namely, the segregation of pure gametes. In the literature of Mendelism valid explanations of phenomena have been given belonging to most of COOK'S categories, and it seems not unlikely that Mendelian explanation will be found sooner or later for the greater part of the phenomena which COOK classes under polar inheritance. The classification as well as the whole paper is academic and represents thinkable conditions rather than actual ones. He attributes polar inheritance, except in the case of dimorphic and polymorphic species, to narrow breeding, but this assumption is as yet unsupported by experimental evidence. The paper is full of misconceptions and misstatements, the recklessness of which is in places startling and amusing. "Elementary species" (p. 206) are wrongly defined as the different kinds or castes of dimorphic or polymorphic species, and "heterozygote" (p. 211) is incorrectly limited to those heterozygotes which display novelties, i. e., characters not found in the parents. The tendencies of the author to construct a peculiar terminology to represent his thought rather than follow accepted usage is shown in the use of "conjugate" with the same meaning as the word "zygote," now universally adopted by experimenters in this field. Failing to grasp the possibility that any character may be made up of two or more factors, he is led to the startling conclusion (p. 220) that it is possible for germ cells to transmit characters for many generations without bringing or tending to bring them into expression, and that the Mendelian "laws of disjunction," "purity of gametes," "alternative inheritance," or whatever they may be called, become at once superfluous and inadequate.

His statements regarding mutations are all academic and mostly without any experimental support. Thus, he says (p. 199), "If the narrow breeding be carried on with persistence, mutative reactions toward greater diversity will appear, and these sudden deviations from an established heredity are even more

[8] COOK, O. F., Mendelism and other methods of descent. Proc. Wash. Acad. Sci. 9:189–240. 1907.

different than were the normally diverse individuals of the original species." Again (p. 220), "Mutative variations commonly obey MENDEL'S laws." But none of the fully demonstrated mutations now known strictly obey MENDEL'S law, though the reverse inference has been frequently made and probably with good cause, namely, that the Mendelian inheritance of a character indicates its origin by mutation. On p. 221 he says, "The general rule must be that new variant gametes conjugate with gametes of the unmutated parental type, and thus have from the first the reproductive status of Mendelian crosses." This is a good suggestion and should be kept in mind by students of evolution, as should also his discussion of the relation between the origin of characters and their effect in the modification of species; but the Oenothera mutants, the best known of all, breed true from the instant of their first appearance, and no instance is known in which a new form has been shown to be already a Mendelian hybrid at the time of its first appearance.

It is difficult to understand why COOK should say, "Mutation is not a period but a condition," since no one ever said or intimated that it is a period. It is neither a period nor a condition, but an act or the result of that act. He says, "Species have more essential evolutionary differences than mutations, though mutations are at the same time more definitely different." Yet the Oenothera mutants are recognized by excellent taxonomists as differing from each other both as to quality and degree, just as wild species differ. Other statements regarding the Oenotheras are not in agreement with published facts, as for instance his statement that *O. Lamarckiana* is dominant over *O. lata* to the extent of 85 per cent.—GEORGE H. SHULL.

The origin of angiosperms.—ARBER and PARKIN[9] have proposed a theory of the origin of the angiosperms, based on the recent development of knowledge in reference to living and fossil forms, especially the Bennettitales. Contrary to the ENGLER scheme, they do not regard such apetalous groups as the Piperales, the Amentiferae, and the Pandanales as representing primitive angiosperms, but rather as reduction forms from those possessing a perianth. The primitive typical angiospermous floral structure is claimed to have been an "amphisporangiate" (substituted for the commonly used terms "bisporangiate" or "ambisporangiate," as the proper antithesis of "monosporangiate") strobilus, in which the megasporophylls are above the microsporophylls and there is a well-marked perianth. Such a strobilus the authors call an "anthostrobilus," restricting "flower" ("eu-anthostrobilus") to angiosperms. A "pro-anthostrobilus" is an earlier form, such as is displayed by the Bennettitales, in which the megasporophylls are not closed, and the microsporophylls have not reached the real stamen form. This implies the existence of a direct ancestral group of the angiosperms, with a strobilus like that of the Bennettitales, and to this hypothetical group the

[9] ARBER, E. A. NEWELL, and PARKIN, JOHN, On the origin of angiosperms. Jour. Linn. Soc. London Bot. **38**: 29–80. 1907.